



SUPPORT FOR THE AMENDMENT

This Amendment amends Claim 1. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 1 is found in the specification at least at page 8, lines 32-33 ("the buffer layer may include an electrically conductive thin film stacked on the oxide"). No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-2 and 5-9 will be pending in this application. Claim 1 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The present invention provides a multilayer thin film including a ferroelectric thin film having improved properties as a result of being epitaxially grown on a primer layer of a perovskite oxide thin film that is grown on a buffer layer on a silicon substrate. See, e.g., specification at page 4, lines 13-16 and 25-30; page 5, lines 18-19.

Claims 1-2 and 5-8 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,801,105 ("Yano-105") in view of U.S. Patent No. 5,674,563 ("Tarui"). In addition, Claims 1-2 and 5-8 are rejected under 35 U.S.C. § 103(a) over JP 10-017394 (where U.S. Patent No. 6,121,647 ("Yano-647") is used as an accurate translation of JP 10-017394) in view of Tarui. Claim 9 is rejected under 35 U.S.C. § 103(a) over Yano-105 or JP 10-017394 (where Yano-647 is used as an accurate translation of JP 10-017394) in view of Tarui, and further in view of U.S. Patent No. 5,744,374 ("Moon") or U.S. Patent No. 5,834,803 ("Nashimoto").

Yano-105 and Yano-647 disclose multilayers of a ferroelectric film grown directly on a buffer layer of Pt/BaTiO₃/ZrO₂ on a Si substrate.

In particular, Yano-105 discloses the structure: BaTiO₃(001) / Pt(001) / BaTiO₃(001) / ZrO₂(001) / Si, and that BaTiO₃ is ferroelectric. Yano-105 at column 28, lines 54-55; column 2, lines 37-38.

Yano-647 discloses the structure: epitaxial ferroelectric film / Pt(001) / BaTiO₃(001) / ZrO₂(001) / Si. Yano-647 at column 7, lines 8-48; column 26, lines 42-47. Yano-647 discloses that BaTiO₃(001) is an insulator. Yano-647 at column 10, lines 16-32; column 12, lines 13-17.

Thus, Yano-105 and Yano-647 disclose an insulating layer of BaTiO₃(001) sandwiched between Pt and ZrO₂. However, Yano-105 and Yano-647 fail to suggest the combination of features of independent Claim 1 including the limitation that "said buffer layer includes an oxide thin film of zirconium or of a rare earth element on said Si substrate; and an electrically conductive thin film having (100) or (001) orientation *directly* on said oxide thin film".

Tarui fails to remedy the deficiencies of Yano-105 and Yano-647. The Office Action relies upon Tarui for disclosing forming an epitaxial ferroelectric PZT film on a Pt substrate using a PbTiO₃ buffer layer to improve flatness of the ferroelectric PZT film. Office Action at page 3, lines 19-21. However, Tarui fail to suggest that Yano-105 and Yano-647 should be modified to include the independent Claim 1 feature that "said buffer layer includes an oxide thin film of zirconium or of a rare earth element on said Si substrate; and an electrically conductive thin film having (100) or (001) orientation *directly* on said oxide thin film".

Because the cited prior art fails to suggest all the limitations of independent Claim 1, the prior art rejections should be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
NFO:CPU/bu



Corwin P. Umbach, Ph.D.
Registration No. 40,211